tional database and may receive data from the CQI buffering database **22038** every 30 minutes, for example. The replicated CQI database **22010** stores redundant CQI message entries; however, the replicated CQI database **22010** may be delayed and/or is only updated periodically. The replication relationship may be a Master-Slave replication relationship. The CQI Buffering database **22038** in the medical facility **22004**, the CQI buffering database **22016** in the service-provider server **22002**, the CQI database **22008**, and/or the replicated CQI database **22010** may provide for non-blocking data reads (e.g., "dirty" reads).

[0897] The system **22000** also includes a report requester/generator **22022** located within the service-provider server **22002** and a report requester/generator **22028** located within the medical facility **22004**. In some embodiments, there is only one report requester/generator (**22022** or **22028**). The report requester/generator **22022** or **22028** is used to either generate a report using CQI messages and/or to instruct the infusion pump **22048**, **22050**, **22052** what kind of information to collect. The report may aggregate and/or categorize the CQI messages.

[0898] The report generated by the report requester/generator **22028** may use data from the CQI buffering database **22038**, information from the CQI database **22008**, and/or the replicated CQI database **22010**. The report generated by the report requester/generator **22022** may use data from the CQI buffering database **22038**, information from the CQI database **22008**, and/or the replicated CQI database **22010** (preferably). The report may be exportable using CSV, HTML, XSL, PDFs, etc. The data may be filtered by an "infusion pump of interest," by clinician, day, serial number, care area, drug pump, any other data, or some combination thereof.

[0899] The reports may be used to determine DERS compliance, hard limit attempted reports (e.g., bolus hard limit attempted and/or a loading dose hard limit was attempted), limit exceeded reports (e.g., soft limit exceeded, bolus soft limit exceeded, loading dose soft limit exceeded), a rate advisory (tritation), an initial secondary check flow, a pump report, (utilization or history) check flow safety report (secondary infusion setup properly), and/or software updates (e.g., CQI, pump, gateway, DERS editor updates etc.).

[0900] In some embodiments of the present disclosure, the CQI messages are de-identified so that no particular patient may be identified. In yet some additional embodiments, the particular infusion pump may not be identified and/or the infusion pump programming attempt may not be identified.

[0901] In yet additional embodiments of the present disclosure, orders for specific reports may be requested by a representative of the medical facility **22004** (e.g., via a web interface or via a software located within the medical facility **22004**) to the service provider server **22002**. The report may be generated using the report requester/generator **22022**. In some embodiments, the report may merge billing data, pump information, CQI messages, EMR data, CPOE data, PIS data, eMAR, and/or some combination thereof together. For example, in some embodiments of the present disclosure, the diagnostic codes may be paired with the prescriptions as stored by the servers of the medical facility **22004** and/or by the service-provider server **22002**. In yet another exemplary embodiment, the service-provider server **22002** can determine if a particular hospital uses the same prescription frequently, the service-provider server **22002** (e.g., using the CQI database **22008**) may suggest or require a pharmacy (via the PIS **22032**) to compound the prescription in bulk and/or fill IV bags in bulk. In some embodiments of the present disclosure the pharmacy and/or the PIS **22032** is separate from the medical facility **22004** (e.g., is associated with and/or is part of the service-provider server **22002**).

[0902] FIG. **167** shows a block diagram of a system **23000** for electronic patient care in accordance with an embodiment of the present disclosure. The system **23002** includes a device gateway manager application **23002**, an external hospital systems **23018**, several tools **23012**, **23014**, **23016**, a device gateway server **23020**, a biomed PC tool **23028**, and several pumps **23022**, **23024**, **23026**. The various portions of the system **23000** may communicate via a wired and/or a wireless connection.

[0903] Several of the pumps **23022**, **23024**, **23026** may be interface into a biomed PC tool **23028**, which may be software running on a laptop. The interface may be via a wired or wireless connection, such as through WiFi, Bluetooth, USB, or other technology.

[0904] The biomed PC tool **23028** can upload pump software **2032** to one or more of the pumps **23022**, **23024**, **23026** and/or update the pumps with a drug administration library **23020**. The biomed PC tool **23028** may be used to download a medication order into one or more of the pumps **23022**, **23024**, **23026**. The biomed PC tool **23028** may be in communication with the device gateway manager application **23002** and/or the hospital system **23018** to download data into one or more of the infusion pumps **23022**, **23024**, **23026**, such when one of the infusion pumps **23022**, **23024**, **23026** is not in active communication with the device gateway server **23020**. The biomed PC tool **23028** may alternatively be software capable of being executed on a tablet device, a smart phone, or a handheld device.

[0905] The pump **23022**, **23024**, **23026** may subscribe to a device gateway server **23020**. For example, through a subscription API, the device gateway manager application **23002** may communicate with the pumps **23022**, **23024**, **23026**. The pumps **23022**, **23024**, **23026** may subscribe to a device gateway server **23020** via web services. The software on the device gateway server **23020** may act as a message router, a service registry, and a pump authorization registry. The device gateway server **23020** may, in some specific embodiments, (1) provide component registry and license management, (2) be an installation repository for receiving, maintaining and tracking new versions of installable components such as device firmware/software, drug administration libraries, enterprise application software, and/or infrastructure software such as OS, application servers DBMS, etc., and (3) perform message routing to distribute messages both among medical devices and to external subsystems.

[0906] The device gateway manager application **23002** includes a database **23004** that houses a local database cache and a system data model. The local database cache includes EMR records for transfer to a hospital system **23018** and/or to one or more of the pumps **23022**, **23024**, **23026**, patient lists (e.g., patients in the hospital), a nurse list (e.g., nurses in the hospital), detailed log information, and/or a list of registered hardware. The system data model may include hardware inventory, therapy, a patient association, and/or conversion of EMR messages.

[0907] The device gateway manager application **23002** also includes a drug administration library **23006**, CQI logs **23010**, and pump **23008**. The CQI logs **23010** may be the CQI messages from the pumps **23022**, **23024**, **23026**. The